

RECEIVED  
CENTRAL FAX CENTER  
MAY 24 2004

OFFICIAL

**REMARKS****I. Petition for Extension of Time**

Applicants herewith petition the Commissioner for Patents to extend the time for response to the Office action mailed January 23, 2004 for one month from April 23, 2004 to May 23, 2004. However, since May 23, 2004 falls on a Sunday, the action may be taken within the extended period on the next succeeding business day. (37 C.F.R. 1.7(a) Authorization is given to charge the extension of time fee of \$110.00 (37 C.F.R. §§1.136 and 1.17) to Deposit Account No. 23-1703. Any deficiency or overpayment should be charged or credited to the above numbered deposit account.

**II. Claim Rejections – 35 U.S.C. §103**

Claims 1, 2, 4-20, 22-25 and 27-53 are rejected under 35 U.S.C. §103(a) as being unpatentable in view of the combination of four references: US 5,750,996 to Drennen, III et al. ("Drennen") in view of US 5,748,311 to Hamann et al. ("Hamann") further in view of US 5,784,160 to Naqui ("Naqui") and further in view of the publication Link et al., "Fluidized bed spray granulation: Investigation of the coating process on a single sphere", Chemical Engineering and Processing, 36 (1997), pp. 443-457 ("Link"). The Link publication is discussed at pages 3-4 of the specification.

For the reasons set forth below, Applicants respectfully submit that there is no motivation to combine the four references in the manner that the Examiner has combined them. Furthermore, the combination of references does not produce or suggest the claimed invention. Finally, the fact that the Examiner has had to rely on four references to support the obviousness

USSN 09/806,795  
Docket No. 1103326-0660  
Page 3 of 11

rejection indicates that the rejection is based on an improper hindsight reconstruction of the claimed invention.

**III. The claimed invention is characterized by  
the concurrent performance of process steps (a), (b) and (c).**

The claimed invention is characterized by, and the claims expressly recite, that a single particle is fluidized on an upwardly directed gas flow. At page 7, line 18 of the specification, it is disclosed that a flow of gas is used to levitate or fluidize the particle as a given position in the chamber. This concept is illustrated by the figure showing the particle (P) levitating or floating above vertical tube 6 in the coating chamber 1. As further disclosed at page 7, lines 26-33 of the specification, a control system is provided to accurately position and maintain the particle (P) at a given position. This position may be changed over time in a controlled manner.

There is nothing to suggest that the words "fluidized" or "levitate", as used in the present application, have a meaning other than their plain, ordinary and customary meaning. For example, The American Heritage Dictionary (2<sup>nd</sup> College Edition) defines "levitate" as follows: *levitate: to rise or cause to rise into the air and float in apparent defiance of gravity.* The same dictionary defines the verb "float" to mean: *float: to cause to remain suspended without sinking or falling.*

Thus, as claimed, a single particle is caused to rise into air and float on an upwardly directed gas flow at a given location in the coating chamber. Once the particle is positioned at the given location, the claimed invention is characterized by three (3) process steps that occur concurrently:

- (a) the particle levitates or float at the given location;
- (b) the particle is coated while it levitates or floats at the given location; and

USSN 09/806,795  
Docket No. 1103326-0660  
Page 4 of 11

(c) a spectroscopic measurement is performed on the coating while the particle levitates or floats at the given location.

The significance of levitating or floating the particle at a given location is described in the specification at page 6, lines 12-15:

Preferably, the particle is fluidized on an upwardly directed gas flow, so that the particle is held at a given spatial location, while being freely rotatable at this location. Thus, the particle can be fixed so that a precise measurement can be effected, and rotating so that a uniform coating can be formed.

Whether taken alone or in combination, the cited (4) references do suggest the concurrent performance of process steps (a), (b) and (c). Nor do the references suggest that a precise measurement is obtained and a uniform coating is formed when process steps (a), (b) and (c) are performed concurrently. As such, there is no motivation to combine the cited references without a hindsight reconstruction of the invention.

**IV. Drennen does not disclose or suggest  
the concurrent performance of process steps (a), (b) and (c).**

The primary reference to Drennen discloses that a multiplicity of particles are coated while they travel upwardly in a coating chamber. The coated particles then fall downwardly through annular passage 14 (col. 4, lines 1-2). The constant movement upward and downward of particles is clearly illustrated by Figures 1 and 2 of Drennen. Therefore, in view of the constant movement of particles, it is impossible to achieve the concurrent performance of process steps (a), (b) and (c) with Drennen:

(a) no single particle floats at a given location but travels in an upward trajectory consisting of a multiplicity of locations to ultimately sink and fall;

(b) coating of a single particle does not take place while the particle levitates or floats at the given location in the chamber, rather a multiplicity of particles is coated while each particle travels in an upward trajectory consisting of a multiplicity of locations within the coating chamber (col. 4, lines 39-43); and

(c) a spectroscopic measurement is not performed on the coating while the particle levitates or floats at the given location, but occurs after the coated particle sinks and falls into the recess of a probe 20.

The constant upward movement of a multiplicity of particles during the coating process is conducive to the formation of coatings having an undesirable lack of uniformity. The subsequent measurement after the coated particle falls into the probe is too late to correct the coating properties of that particle. In contrast to Drennen, a uniform coating is formed and a precise measurement is obtained when process steps (a), (b) and (c) are performed concurrently in accordance with the claimed invention.

## **V. Hamann and Naqui are nonanalogous art.**

### **A. Hamann**

The secondary reference to Hamann is directed to the determination of particle size and characteristics of particles immersed in gaseous or liquid fluids. In this regard, the Examiner is correct that Hamann discloses that the characteristics of a particle flowing in gas can advantageously be monitored (Office Action at page 4). However, the purpose of the *in situ* measurement by Hamann is not to control, monitor or otherwise influence the formation, shape or characteristics of the particles themselves.

USSN 09/806,795  
Docket No. 1103326-0660  
Page 6 of 11

Specifically, the purpose of Hamann is to obtain *in situ* measurements of the concentration of existing particles immersed in a fluid to control industrial processes, e.g., combustion, so that solids emissions are reduced (col. 2, lines 39-44). Hamann is also intended for other industrial applications, for example, where the size of a rough particle has to be monitored to ensure process quality. Such applications include grinding and milling processes, and those processes where a catalyst undergoes degradation that is measurable by a change in particle size or surface roughness or both (col. 2, lines 44-50).

It is evident, therefore, that Hamann is neither within the field of Applicants' endeavor nor concerned with the particular problem with which Applicants were involved. It was Applicants endeavor to concurrently measure the formation of a coating on a single particle during the coating process to form a uniformly coated particle. There is no mention or suggestion by Hamann of any concurrent or *in situ* process, e.g., a coating process, when the particles immersed in a gaseous or liquid fluid are measured. As such, Applicants submit that the purpose and disclosure of Hamann is so remote from the field of the claimed invention that it must be considered nonanalogous art.

Hamann's measurement is merely a snapshot of the particulate content immersed in a fluid. The purpose of the snapshot is to provide information which is used to improve the efficiency and quality parameters of industrial processes. The information is not used in any way to control, monitor or otherwise influence the formation, shape or characteristics of the particles themselves. Thus, Hamann is neither within the field of Applicants' endeavor nor concerned with the particular problem with which Applicants were involved.

Similar to Drennen, Hamann does not disclose or suggest that a single particle immersed in a liquid or gaseous fluid is caused to levitate or float at a given location while the particle is

coated and the coating layer is measured for uniformity and other properties at the given location. Therefore, it is also impossible to achieve the concurrent performance of process steps (a), (b) and (c) of the claimed invention with Hamann.

### **B. Naqui**

The tertiary reference to Naqui is directed to an apparatus and method for non-direct measurement of particles to determine size and other characteristics. A stated purpose of Naqui is to determine the size of stochastic particles, i.e., particles with an irregular shape, a non-homogeneous composition or both (col. 1, lines 10-12). Examples of stochastic particles include: particles in two-phase or multiphase environments such as multiphase flows with irregular elements occurring coal combustors and in slurry transport devices; textured paint incorporating particles of metal or other solids; and non-homogenized milk (col. 1, lines 51-57).

As with Hamann, the purpose of the *in situ* measurement by Naqui is not to control, monitor or otherwise influence the concurrent formation, shape or characteristics of the particles themselves. The purpose of the information is to enhance the characterization of stochastic particles (col. 1, 10-11). There is no mention or suggestion by Naqui of any concurrent or *in situ* process, e.g., a coating process, during the measurement of particles to influence the properties or characteristics of the properties. As such, Applicants submit that the purpose and disclosure of Naqui is so remote from the field of the claimed invention that it must be considered nonanalogous art.

Naqui's measurement is merely a snapshot of particles having an irregular shape, a non-homogeneous composition or both. The information is not used in any way to control, monitor

USSN 09/806,795  
Docket No. 1103326-0660  
Page 8 of 11

or otherwise influence the formation, shape or characteristics of the particles themselves. Thus, Naqui is not reasonably pertinent to the particular problem with which the Applicants were involved. It is an express purpose of the claimed invention to monitor one or more parameters relating to the coating, e.g., thickness and other properties related to the coating, during the coating process on a single particle. Thus, Naqui is neither within the field of Applicants' endeavor nor concerned with the particular problem with which Applicants were involved.

Similar to Drennen and Hamann, Naqui does not disclose or suggest that a single stochastic particle is caused to levitate or float at a given location while the particle is coated and the coating layer is measured for uniformity and other properties at the given location. Therefore, it is also impossible to achieve the concurrent performance of process steps (a), (b) and (c) of the claimed invention with Naqui.

**VI. A prima facie case of obviousness has not been established.**

The fourth cited reference is the Link publication. Link is discussed at pages 3-4 of the specification. In brief, Link investigated the fundamental physical mechanisms that lead to particle growth by layering. Using a laboratory-scale apparatus, Link caused a single sphere to levitate on a fluidizing air flow supplied by a capillary tube. The sphere was coated with droplets of a coating liquid while the sphere rotated freely at a suspended and stable location in a coating vessel. A rough measurement of the overall coating thickness is obtained by weighing the sphere before and after the actual coating process and determining the difference in weight. The morphology of the coating is qualitatively examined by arranging the coated sphere in a scanning-electron microscope. For both of these measurements, the coated sphere must be removed from the apparatus.

USSN 09/806,795  
Docket No. 1103326-0660  
Page 9 of 11

Link represents the state of the art at the time the claimed invention was made. Link is within the field of Applicants' endeavor and it presented the problem with which Applicants were involved. These problems included difficulties in making quantitative, time-resolved measurements of coating properties. A further disadvantage is that only a few coating properties could be measured with the apparatus and method disclosed by Link. Another drawback is that the Link process could only be used with standardized spheres.

Advantageously, the above-mentioned drawbacks of the apparatus and method disclosed by Link are resolved with the claimed invention.

The Examiner alleges that the combination of Drennen, Hamann, Naqui and Link render the claimed invention obvious. However, in view of the preceding discussion as summarized below, Applicants respectfully submit that a *prima facie* case of obviousness has not been established:

1. The claimed invention is characterized by the concurrent performance of process steps (a), (b) and (c). Uniform coated particles and precise measurements regarding the coating are obtained when process steps (a), (b) and (c) of the claimed invention are performed concurrently.
2. The primary reference to Drennen does not disclose or suggest the concurrent performance of process steps (a), (b) and (c) of the claimed invention. In view of the constant movement of a multiplicity of particles along an upward trajectory and ultimate descent of the coated particles, it is impossible to achieve the concurrent performance of process steps (a), (b) and (c) with Drennen.



USSN 09/806,795  
Docket No. 1103326-0660  
Page 10 of 11

3. Hamann and Naqui are nonanalogous art. Neither Hamann nor Naqui is within the field of Applicants' endeavor or concerned with the particular problem with which Applicants were involved.
4. Hamann's measurement is merely a snapshot of the particulate content immersed in a fluid. The purpose of the snapshot is to provide information which is used to improve the efficiency and quality parameters of industrial processes. The information is not used in any way to control, monitor or otherwise influence *in situ* the formation, shape or characteristics of the particles themselves.
5. The purpose of the *in situ* measurement by Naqui is not to control, monitor or otherwise influence *in situ* the concurrent formation, shape or characteristics of the particles themselves. The purpose of the information is to enhance the characterization of stochastic particles.

When the primary reference to Drennen, which fails to disclose or suggest the concurrent performance of process steps (a), (b) and (c) of the claimed invention, is combined with the nonanalogous prior art to Hamann and Naqui, one is left with Link which presented the particular problem with which Applicants were involved. Applicants submit that the claimed invention represents a patentable improvement over Link. None of the cited references, whether taken alone or in combination, suggests the claimed invention. The fact that the Examiner had to rely on four references to support the obviousness rejection indicates that the rejection is based on an improper hindsight reconstruction of the claimed invention.

USSN 09/806,795  
Docket No. 1103326-0660  
Page 11 of 11

For all of the foregoing reasons, the Examiner has failed to establish a *prima facie* case of obviousness. Withdrawal of the §103 rejection is therefore requested.

**CONCLUSION**

Applicants submit that pending claims 1, 2, 4-20, 22-25 and 27-53 are in condition for allowance, which action is earnestly solicited. The Commissioner is hereby authorized to charge Deposit Account No. 23-1703 in the event that any fee is required in connection with this communication.

Dated: 24 May 2004

Respectfully submitted,



John M. Genova  
Reg. No. 32,224  
Attorney for Applicants

Customer No. 007470  
(212) 819-8200